

## **Development of Enhanced Scattering diagnostic on J-TEXT**

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Electron thermal transport is important for the future fusion reactor. Electron temperature gradient (ETG) mode is one of the main plasma instabilities relevant to the electron thermal transport. For the size of ETG turbulence is at electron-scale, it is hard to diagnose. In 1950s, theory work of Ozaki shows the scattering coefficient for extra-ordinary mode radiation is peaked near the upper hybrid (UH) frequency. [1] The theoretic result was later proved in experiments. [2,3] The enhanced backscattering near UH resonance layer with high wave numbers is suitable for observing the small-scale ETG turbulence. This method has been successfully applied on FT-1 and FT-2 tokamak. [4,5] An Enhanced Scattering diagnostic was proposed and designed on J-TEXT to observe the ETG turbulence and study relative electron thermal transport. A prototype diagnostic system has been developed and installed on J-TEXT, and preliminary experimental results have been obtained, confirming the feasibility of using upper hybrid resonance layer scattering for diagnostics on J-TEXT.

### References

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